UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30323

Report No.: 50-160/88-01

Licensee: Georgia Institute of Technology
225 North Avenue
Atlanta, GA 30332

Docket No.: 50-160 License No.: R-97

Facility Name: Georgia Institute of Technology

Inspection Conducted: March 17-18, and April 6 and 11, 1988

Inspector: P. E. Fredrickson 5/18/88
Date Signed

Approved by: David M. Verrelli, Branch Chief 5/18/88
Division of Reactor Projects
Date Signed

SUMMARY

Scope: This special, announced inspection involved inspection of the licensee's method for identifying and correcting reactor operations and health physics safety problems.

Results: Violations or deviations were not identified in the area inspected.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

R. A. Karam, Director, Neely Nuclear Research Center (NNRC)
R. N. MacDonald, Associate Director, NNRC
J. M. Puckett, Consultant
R. M. Boyd, Senior Research Associate (former Manager of Office of Radiation Safety)
P. B. Sharpe, Safety Engineering Assistant (former Health Physicist)

2. Exit Interview

The inspection scope and findings were summarized on March 18, 1988, with those persons indicated in paragraph 1. Dissenting comments were not received by the licensee. Proprietary information is not contained in this report. The following new item was identified during the inspection:

Inspector Followup Item 50-160/88-01-01, Load Testing of Overhead Crane, paragraph 3.

Inspector Followup Item 50-160/88-01-02, Beam Port Experiments, paragraph 3.

3. Resolution of Safety Issues

The inspector reviewed the licensee's method for resolving safety issues raised within the NNRC organization. Up until July 1987, the licensee did not have any written policy or procedure on how reactor operations or health physics concerns would be brought to the attention of the NNRC management, nor how the solution to these issues would be documented. Similar to other non-power reactor facilities, a formal program was not in place; thus issues were surfaced and resolved in a basically informal manner. On July 29, 1987, after the NNRC reorganization, a memo, subject "Personal Logs", was issued by the NNRC Director. A portion of this memo did provide some direction by stating that personnel should bring issues either verbally or in writing to the Director. This memo did not address documentation of the problem resolution.

The inspector reviewed with the Director 26 issues that had been identified at the NNRC from 1984 to 1988. These issues had been identified through a review of transcripts provided by the NRC's Office of Investigation (OI). These transcripts were the results of interviews conducted in early 1988. In selecting the items to review, the inspector did not differentiate between safety or non-safety concerns, nor whether or not

the issues affected the NRC license. If a technical problem was identified in the transcripts, the issues were reviewed. Because the purpose of the inspection was to review the corrective action methods used to resolve problems occurring at the NNRC, problem areas were reviewed, independent of whether the transcript identified the corrective action to be satisfactory or not. Twenty-two of these issues occurred prior to the July 1987 memo. Of the 26 issues, corrective actions on four of these issues were addressed in some fashion by a NNRC memo. All the others, while possibly addressed in individual logs, appeared to be identified and resolved in either a verbal fashion or informal documentation. Interviews conducted revealed that the Director was aware of 22 of the specific issues and that each case was addressed by the Director. The remaining four issues had either minimal safety significance or appeared to the inspector to have been resolved satisfactory.

One of the 26 issues related to the reactor building crane being maintained by the NNRC staff will be reviewed during a subsequent inspection. Although the inspector did not have an indication that crane maintenance is unsatisfactory, the question of certified load testing of research reactor overhead cranes was surfaced during the inspection. As the NNRC does not load test certify the overhead crane, a review of the need for this testing is identified as an Inspector Followup Item, 160/88-01-01, Load Testing of Overhead Crane.

In addition to reviewing issues identified in the OI transcripts, the inspector also reviewed the licensee's files on issues brought to the attention of NNRC management. The inspector reviewed 14 memos in which concerns were brought to the attention of the licensee. Thirteen of these were documented after the July 1987 memo. Only one of the 14 was also on the list of 26 OI transcript issues.

a. Technical Issues

After reviewing the 26 issues with the Director, the inspector selected eight technical issues to review in some detail by interviewing other personnel involved. Those issues were selected based on the following criteria: (1) the issue had potential safety significance and had not been detailed in an inspection report, or (2) the resolution of the issue was unclear or controversial. These issues are discussed below.

(1) Lab Coats at Cobalt Pool. In mid-1986, a concern was raised involving wearing lab coats during a cobalt transport activity. Lab coats were required by the health physics technician, but the workers refused, due to elevated temperatures. The final decision from the Director was to wear sleeveless lab coats. The health physics technician expressed his disagreement to both the Director and his health physics supervisor. The health physics supervisor did not stop work or recommend such action to the Radiation Protection Committee.

(2) Defective Hot Cell Monitor. In early 1987, the Radiation Protection Committee suspended NNRC hot cell operations due to an unreliable radiation monitor and required replacement of this monitor. This monitor had been exhibiting an increasing frequency of failure during the previous year. Concerns over the monitor had been expressed to the Director by the health physics staff, requesting a new model. Up until early 1987, frequent repair of the monitor appeared to be the NNRC solution. According to the health physics supervisor, this monitor had exhibited unreliability since 1972 and that his efforts to have it replaced by previous Directors had also been unsuccessful. In this case, based on a Radiation Protection Committee letter of March 4, 1987, the Director could have been more responsive in replacing the monitor. The monitor was replaced in April 1987. The inspector could not identify that the Director had failed to address repair of an inoperable monitor.

(3) Beam Port Shielding Calculations. In September 1986, a health physics technician expressed concerns over reactor beam port experiments. The concerns were that inadequate pre-experiment calculations resulted in higher than expected radiation levels, necessitating significant shielding additions, reduced reactor power and decreased experiment time; and that different beam ports were utilized than were authorized on the experiment approval form. These concerns were expressed to the health physics supervisor and the Director. A response to these concerns was sent by the health physics supervisor to the health physics technician, stating that this area needed to be more closely monitored, but no definitive solution was provided by either the health physics supervisor or the Director. Discussion with the Director identified that the solutions were to raise reactor power slower than it had been previously and to require the Director's approval on all future radiation work permits. The solution to the calculation problem was not documented. Discussion with the health physics supervisor did not reveal any concern over these solutions. The unauthorized beam port usage was identified as a violation in Inspection Report 160/87-03. Although the inspector had no definitive concern over current beam port activities, due to the undocumented resolution of the calculation problem, inspection of beam port experiment activities is identified as an Inspector Followup Item 160/88-01-02, Beam Port Experiments.

(4) Waste Tank Agitation. Although the issue had been inspected during a previous NRC inspection report, the inspector reviewed this issue because a concern was expressed about the agitation system of the NNRC waste tank when, in fact the waste tank does not have an agitator. Subsequent discussion revealed that

confusion over waste system operation resulted in this misinformation. Resolution of the issue is discussed in Inspection Reports 160/87-02 and 160/87-03.

(5) Painting of Cobalt Pool. In early 1986, the cobalt storage pool needed to be repainted. Operations personnel wanted to use a forklift inside the pool to move the painters around, while health physics personnel opted for the use of ladders. The Director decided on the use of the forklift. The inspector could not determine any significant health physics concern over using the fork lift. Work was not stopped by the health physics supervisor nor did the Radiation Protection Committee stop work.

(6) Entry Into Isolated Containment Building. If the NNRC containment building becomes ventilation-isolated, the building atmosphere requires special testing prior to entry. In mid-1986, an NNRC staff member failed to perform this test and was identified by a health physics technician. Interviews revealed that the health physic supervisor may have been notified. There was no indication that the Director was informed. Formal documentation of this event could not be located.

(7) Reactor Light On. In March 1986, a health physics technician observed the control room operator outside the control room, with the Reactor Light on, thus concluding that the reactor was at power. The operator denied that the reactor was operating. With the reactor key in position, the light comes on. The technician did not appear to have any other basis for concluding that the reactor was operating. The Director interviewed the parties and concluded that the reactor was not operating.

(8) Cobalt Encapsulation. In mid-1986, approximately 700,000 curies of Co-60 was received from the Savannah River Plant. This cobalt was to be stainless steel encapsulated expeditiously due to concern over cobalt leakage and contamination of the storage pool. The Radiation Protection Committee expressed concern that the effort was taking too long. The inspector determined that although encapsulation may have been slower than the Committee desired, this activity was under surveillance by the Committee and any inappropriate action could have been rectified.

After completing the review of these technical issues, the inspector determined the none of the 26 issues reviewed revealed a safety problem that either was significant or, if significant and known to the NNRC management, was not addressed satisfactorily by the management, or if not addressed to the satisfaction of those identifying the concern, could not have been addressed to an oversight committee. Additionally, interviews with the health physics supervisor did not reveal any one specific additional issue that the Director did not take some action on to resolve.

b. Personnel Issues

As a part of the resolution of technical issues, the inspector also reviewed personnel actions taken when technical problems were caused by personnel error. Interviews revealed that counseling appears to have been used in several instances involving the NNRC staff, but apparently retraining or disciplinary action was rarely, if ever, used. Specifically, the inspector reviewed actions taken with respect to a striking of the hot cell window with a wrench in early 1985, an operator failing to isolate a reactor coolant line in 1986, a reactor excursion event in early 1987, a topaz irradiation experiment in mid-1987, and failure of operations personnel to wear dosimetry and protective clothing. The Director provided documentation to support that the individual involved with the hot cell window had been counseled on his actions. All the other issues involved apparent informal counseling. The Director stated that the individual issues did not appear to warrant more than counseling and that the cumulative effect of the reviewed issues had not been evaluated by the NNRC management.

With respect to the corrective action program at the NNRC, the program appears to have been marginally successful. The informal undocumented system in use prior to July 1987, combined with the strained working relationship at the NNRC (as discussed in Inspection Report 160/87-06) contributed to actions being resolved sometimes slowly and also controversial solutions not being raised to the proper level of management for resolution. The documented system using informal memos at the NNRC appears to have improved the corrective action program at the NNRC, whereby the staff has a mechanism to address issues and the management has the responsibility to reply and resolve the issues.

The personnel action effort at the NNRC appears to consist mainly of informal counseling sessions, if even that. The NNRC management appeared to be able to recognize major personnel errors at the facility, but did not appear to have a defined threshold for when to take action beyond informal counseling for an event involving either one large error or several events revealing a pattern of smaller errors. The ongoing NNRC 1988 Action Plan appears to address actions such as retraining to correct trends in personnel errors and should improve the identification and correction of personnel errors.

Violations or deviations were not identified in these areas.